

CLAIMS

1. A method for evaluating the antioxidant potential of a biological sample comprising the steps of:

5 (a) collecting a sample containing at least oxidizable substrates from a living body;

(b) initiating an oxidation reaction of said oxidizable substrates;

(c) continuing said oxidation reaction; and

10 (d) quantifying oxidation products formed from said oxidizable substrates by determining the rate of said oxidation reaction during the progress thereof or by performing an assay after said oxidation reaction has been stopped,

15 wherein said steps (b) and (c) are performed in the presence of one or more antioxidant components.

2. The method of claim 1 wherein said biological sample is blood, plasma or serum.

3. The method of claim 1 wherein one of said antioxidant
20 components is α -tocopherol.

4. The method of claim 1 wherein said oxidation reaction is initiated with an oxidation initiator.

5. The method of claim 4 wherein said oxidation reaction is controlled by the concentration of said oxidation
25 initiator at the start of said oxidation reaction so that said antioxidant components can continue to exist throughout said oxidation reaction.

6. The method of claim 4 wherein said oxidation

initiator is 2,2'-azobis (2-amidinopropane) hydrochloride.

7. The method of claim 5 wherein said oxidation initiator is 2,2'-azobis (2-amidinopropane) hydrochloride and said concentration is 5-30 mM.

5 8. The method of claim 1 wherein said oxidizable substrates are lipids and oxidation products formed from said lipids include lipid oxides and lipid peroxides.

9. The method of claim 8 wherein said lipids are cholesterol esters, said lipid oxides are cholesterol ester
10 hydroxides and said lipid peroxides are cholesterol ester hydroperoxides.

10. The method of claim 1 wherein said quantification of oxidation products formed from said oxidizable substrates is performed after stopping said oxidation reaction.

15 11. The method of claim 1 wherein said quantification of oxidation products formed from said oxidizable substrates comprises HPLC elution of analytes which allows said quantification.

12. The method of claim 11 wherein said analytes are
20 detected with UV rays.

13. The method of claim 1, further comprising the step of adding an antioxidant material to said biological sample before performing said step (b) in the case where said biological sample does not contain a sufficient amount of
25 antioxidant components to accomplish said steps (b) and (c) in the presence of the antioxidant components.

14. The method of claim 13 wherein said antioxidant material added to said biological sample is the same as one

of antioxidant components inherently contained in said biological sample.

15. A method for diagnosing a disease or evaluating the prognosis and/or predicting the progress of said disease of
5 a patient of interest on the basis of the antioxidant potential of a biological sample evaluated by the method of claim 1.

16. The method of claim 15 wherein said disease is a chronic endocrine disease, brain disease, pulmonary disease,
10 hepatic disease, renal disease, circulatory disease, chronic inflammatory disease or cancer.

17. A method for evaluating the antioxidant potential of an antioxidant test component comprising the steps of:

(a) collecting a sample containing at least
15 oxidizable substrates from a living body;

(b) adding said antioxidant test component to said biological sample;

(c) initiating an oxidation reaction of the mixture of step (b);

20 (d) continuing said oxidation reaction; and

(e) quantifying oxidation products formed from said oxidizable substrates by determining the rate of said oxidation reaction during the progress thereof or by performing an assay after said oxidation reaction has been
25 stopped,

wherein said steps (c) and (d) are performed in the presence of one or more antioxidant components.

18. The method of claim 17, further comprising the step

of adding an antioxidant material before performing said step (c) in the case where said biological sample does not contain a sufficient amount of antioxidant components to accomplish said steps (c) and (d) in the presence of the
5 antioxidant components.